

Radiometric Dating Practice

May 1, 2015 9:26 PM

Name: _____

Earth Science 11
Radiometric Dating Practice

SHOW YOUR WORK!

1. What is the definition of "half life?"
2. How many half lives have passed if a rock sample has:
 - a. 50% daughters (stable material) and 50% parents (radioactive material)?

$$100\% P \rightarrow 50\% P \quad \therefore 1 \text{ h.l.}$$

- b. 150 daughters and 50 parents?

$$200P \rightarrow 100P \rightarrow 50P \quad \therefore 2 \text{ h.l.}$$

- c. 7/8 daughters and 1/8 parent?

$$\frac{8}{8}P \rightarrow \frac{4}{8}P \rightarrow \frac{2}{8}P \rightarrow \frac{1}{8}P \quad \therefore 3 \text{ h.l.}$$

3. What is the formula for calculating the age of a rock?

$$\text{Age} = \frac{\# \text{ of}}{\text{h.l.}} \times \frac{\text{length of}}{\text{a h.l.}}$$

4. For each of the samples in #2, calculate the age if the half life of the radioactive material is 5 million years

a. Age = $1 \text{ h.l.} \times 5 \text{ mill yrs} = 5 \text{ mill yrs old}$

b. Age = $2 \text{ h.l.} \times 5 \text{ mill yrs} = 10 \text{ mill yrs old}$

c. Age =

5. Which radioactive element is used to find the age of something that used to be living?

Carbon 14 (\rightarrow Nitrogen 14)

6. Explain in detail how to find the age of a rock using radiometric dating.

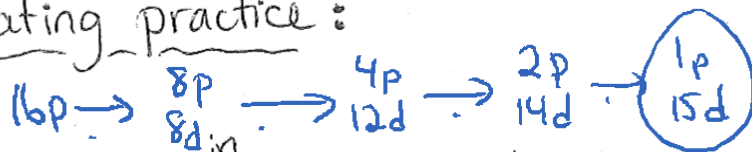
- Compare amounts of parent and daughter to find # of half lives

- calculate age = $\frac{\# \text{ of}}{\text{h.l.}} \times \frac{\text{length of}}{\text{h.l.}}$

DID YOU SHOW YOUR WORK?

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More radiometric dating practice:

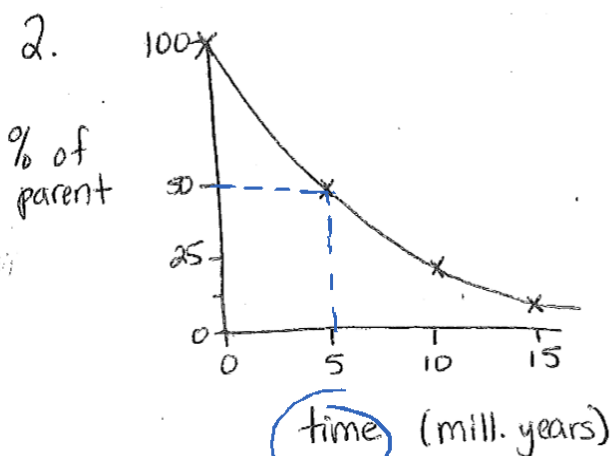


1. A piece of wood found in an ancient tomb has a ratio of 1 parent to 15 daughters.

a) how many half lives have passed? 4 h.l.

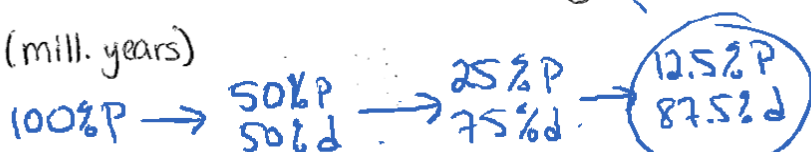
b) how old is the wood? (Hint: what type of dating must be done on wood?) C^{14} h.l. = 5730 yrs

$$\text{Age} = 4 \text{ h.l.} \times 5730 \text{ yrs.}$$



a) how long is a half-life? 5 mill yrs

b) how long would it take until there was 87.5% of the stable daughter?



3. True or false (if false, explain why): Age = 5 mill yrs \times 3 h.l.

a) uranium 238 dating can be used to find the age of a dinosaur bone. F, U not in living things

b) Carbon 14 dating can find the age of a dinosaur bone. F, too old, C^{14} can only be used for 60,000 yrs or younger

c) Carbon 14 can only be used for an object that was previously alive. T